

AMENDMENTS TO THE SPECIFICATION

Please replace the text beginning with paragraph 0087 of the specification with the following text. No new matter is being submitted with this amendment.

[0087] The disc 10 has certain load versus deflection characteristics that are similar to those found in the natural human disc. As was stated above, it is useful, once implanted, that the surgeon and patient can know the state of load experienced by the device. In this regard, referring to Figure 25, embodiments of the disc have, integral to its construction, strain gauges [[38]]41 or other means of force or pressure transduction. For illustration purposes only, not to be construed as limiting the invention thereto, the discussion will be directed to the use of strain gauges [[38]]41. An electronics package 380 having a transducer can be connected to signal conditioning and amplification circuitry on a micro scale in order to fit within the constraints of space available in the upper or lower endplate 20, 30. In this embodiment, the center stop is integral to the lower endplate 30 and consists of a hollow raised cylindrical platform 381. The space inside this raised platform 381 can house, for example, a 3 x 3 x 3 mm electronics package 380. The package can be wired to strain gauges [[38]]41 on the inside of the raised cylinder and in peripheral locations around the bottom endplate 30. Alternatively, the transduction means can be connected to electronics 380 such as piezoelectronics that eliminate the need for signal conditioning and amplification.

Referring now to Figure 25, there is shown an endplate having an internal region defined on one side by part of the endplate 30 and on an opposite side by a layer 383 that may connect with a compression stop. There may be a force transducer [[38]]41, such as a strain gauge, in the interior region directly adjacent to where the polymer (elastomer)

40 adjoins the endplate 30. There may be a force transducer [[38]]41, such as a strain gauge, inside the compression stop. Inside the compression stop there may also be other electronics 380 such as a microelectromechanical system, signal conditioning, telemetry, or a coil. The layer 383 together with the rest of the endplate 30 may form a hermetic seal enclosing electronics 380 within the internal region. The layer 383 may be laser-welded to the rest of the endplate 30. Other types of force transducers [[38]]41 include piezoelectric sensors.

*Please replace paragraph 0088 of the specification with the following paragraph.
No new matter is being submitted with this amendment.*

[0088] Since the center stop cylinder is not in contact with the polymer, the strain gauge [[38]]41 placed there will only measure contacts between the upper endplate and the center stop on the lower endplate. This data is useful in itself as an indicator of when loads are sufficiently high to engage the stop mechanism. However, in addition, more continuous data is available from peripherally placed strain gauges [[38]]41 that will measure stress in the endplate caused by compression, bending, torsion, and shear loads in all directions. This information can give a precise measure of the magnitude and direction of loads on the disc. FIGS. 22 and 25 depict how one embodiment of an artificial disc 10 uses strain gauges [[38]]41 to measure the load experienced by the prosthesis and relay that data on demand.

*Please replace paragraph 0090 of the specification with the following paragraph.
No new matter is being submitted with this amendment.*

[0090] The data can indicate changes in the device since its implantation. It can also store load history to indicate if the patient is following doctor's orders for allowed activities. The power source for the memory-based data storage element is optionally a micro battery or a capacitor charged from the external inductive couple. The micro battery or capacitor may be part of the electronics package and may optionally be stored in the raised platform 381. The use of piezos is also possible. In one embodiment, a mylar flex circuit is pre-made and placed on the second endplate. Transducers or load or pressure sensors [[38]]41 may be embedded on the mylar flex circuit and connected to the signal conditioning and amplifying electronics.